

JUL 22 2004

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DATE: July 22, 2004

TO: UNITED STATES PATENT AND TRADEMARK OFFICE
MAIL STOP AMENDMENT
Art Unit 3663

Andrew T. Spence
Reg. No. 45,699

In re: Robert R. Rice

Appl. No. 10/090,296

Filed March 4, 2002

Title: FIBER AMPLIFIER HAVING AN ANISOTROPIC NUMERICAL APERTURE FOR EFFICIENT COUPLING OF PUMP ENERGY

Confirmation No. 6652

Art Unit: 3663

Examiner Mark Hellner

Please process the attached Amendment (15 pages) and the Amendment cover sheet (2 pages) and fax confirmation of receipt to 704-444-1111. Thank you.

NO. OF PAGES:
(Including cover page)

18

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FAX NUMBER: 703-872-9306

CLIENT/MATTER: 038190/241566

REQUESTED BY: Sarah Simmons 1142

VOICE NUMBER:

CLT01/4544166v1

Attorney's Docket No. 038190/241566

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Robert R. Rice

Appl. No.: 10/090,296

Filed: March 4, 2002

For: FIBER AMPLIFIER HAVING AN ANISOTROPIC

NUMERICAL APERTURE FOR EFFICIENT COUPLING OF PUMP ENERGY

Confirmation No.: 6652

Group Art Unit: 3663

Examiner: Mark Hellner

Mail Stop Amendment
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, VA 22313-1450

Transmitted herewith is an AMENDMENT in the above-identified patent application.

- ☐ Applicant claims small entity status. See 37 C.F.R. § 1.27.
☐ No additional fee is required.

The fee has been calculated as shown below:


(COL. 1)		(COL. 2)	(COL. 3)	SMALL ENTITY		OTHER THAN A SMALL ENTITY	
CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDIT. FEE	OR RATE	ADDIT. FEE
TOTAL	* 28	** 28	= 0	X 9=	\$	X 18=	\$ ----
INDEP	* 11	*** 4	= 7	X 43=	\$	X 86=	\$ 602.00
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				+145=	\$	+290=	\$
				TOTAL ADD FEE \$		OR TOTAL	\$ 602.00

- * If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.
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In re: Robert R. Rice
Appl. No.: 10/090,296
Filed: March 4, 2002
Atty. Dock. No. 038190/241566
Page 2

- ☒ Please charge my Deposit Account No. 16-0605 in the amount of \$602.00.
- ☐ A check in the amount \$ to cover the additional fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge any deficiency in payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 16-0605.
- ☒ Any additional filing fees required under 37 C.F.R. § 1.16 for the presentation of extra claims.
- ☒ Any patent application processing fees under 37 C.F.R. § 1.17.

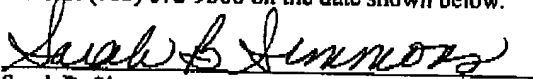
Respectfully submitted,


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CLT01/4658669v1

July 22, 2004
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JUL 22 2004

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

Appl. No.: 10/090,296
Applicant(s): Robert R. Rice
Filed: March 4, 2002
Art Unit: 3663
Examiner: Hellner, Mark
Title:

Confirmation No.: 6652

FIBER AMPLIFIER HAVING AN ANISOTROPIC NUMERICAL
APERTURE FOR EFFICIENT COUPLING OF PUMP ENERGY

Docket No.: 038190/241566
Customer No.: 00826

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT
37 C.F.R. § 1.121

Sir:

In response to the Office Action dated March 25, 2004, please amend the above-identified application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims beginning on page 3 of this paper.

Remarks/Arguments begin on page 11 of this paper.

Appl. No.: 10/090,296

Filed: March 4, 2002

Page 2

Amendments to the Specification:

Please amend the paragraph beginning on page 6, line 28, as follows:

Within the first segment 34 of the fiber amplifier 20, the outer core 26 interfaces with the cladding layer 26 to thereby define a first numerical aperture, NA_1 , which can be represented according to the following:

$$NA_1 = \sqrt{N_p^2 - N_{cl}^2} \quad (1)$$

In equation (1), N_p is the refractive index of the outer core, and N_{cl} is the refractive index of the cladding layer. In the second segment 36 of the fiber amplifier, the outer core at least partially interfaces with a material 44, such as air, to thereby define a second numerical aperture, NA_2 , which can be defined according to equation (2) as follows:

$$NA_2 = \sqrt{N_p^2 - N_m^2} \quad (2)$$

In equation (2), N_m is the refractive index of the material which, when the material comprises air, equals one. To provide the fiber amplifier with an anisotropic numerical aperture, the refractive index of the cladding layer is different than the refractive index of the material.